

WHAT IS CLAIMED IS:

1. A network device configured to control communication of data frames between stations, comprising:

a plurality of receive ports configured to receive data frames from the stations;

a memory configured to store address information and data forwarding information

5 associated with the received data frames; and

processing logic configured to:

process and forward the received data frames to destination addresses without modifying the received data frames, when the network device is operating in accordance with a first protocol, and

process and forward the received data frames to destination addresses, at least one of the received data frames being modified before being forwarded, when the network device is operating in accordance with a second protocol.

2. The network device of claim 1, wherein the first protocol is an IEEE 802.1D protocol and the second protocol is an IEEE 802.1Q protocol.

3. The network device of claim 1, further comprising:

a register configured to store information indicating whether the network device is operating in accordance with the first protocol, wherein the processing logic is further configured to:

5 read the contents of the register, and

determine whether the network device is operating in accordance with the first protocol or the second protocol based on the contents of the register, the first protocol being an IEEE 802.1D protocol and the second protocol being an IEEE 802.1Q protocol.

4. The network device of claim 1, wherein when the network device is operating in accordance with the first protocol, the processing logic is configured to:

retrieve a data frame received on one of the plurality of receive ports from an external memory, and

5 forward the received data frame to at least one port identified by the data forwarding information without at least one of inserting virtual local area network (VLAN) information into the received data frame, deleting VLAN information included with the received data frame and modifying VLAN information included with the received data frame.

5 6. The network device of claim 4, wherein the data forwarding information identifies a first transmit port and a first VLAN and when the network device is operating in accordance with the second protocol, the processing logic is configured to:

retrieve a data frame received on one of the plurality of receive ports from an external memory,

at least one of insert VLAN information into the received data frame, delete VLAN information included with the received data frame and modify VLAN information included with the received data frame, based on whether the first transmit port is a member of an untagged set for the first VLAN, and

10 forward the received data frame to the first transmit port.

7. The network device of claim 1, wherein the processing logic is further configured to:

identify data forwarding information for a first one of the received data frames,
generate a forwarding descriptor for the first data frame, the forwarding descriptor
5 including:

an untagged set field identifying at least one transmit port, and

an opcode field including information identifying whether the first data frame was at least one of untagged, VLAN-tagged and priority-tagged.

7. The network device of claim 6, wherein the processing logic is further configured to: delete a VLAN tag in the first data frame based on the contents of the untagged set field and the opcode field and whether the network device is operating in accordance with the second protocol.

8. In a network device that controls communication of data frames between stations, a method comprising:

setting an operating mode to at least one of a first operating mode and a second operating mode for the network device;

storing information in a memory of a network device, the information including address information and data forwarding information;

receiving data frames on a plurality of receive ports of the network device;

processing and forwarding the received data frames to destination addresses without modifying the received data frames, when the network device is in the first operating mode; and

processing and forwarding the received data frames to destination addresses, at least one of the received data frames being modified before being forwarded, when the network device is in the second operating mode.

9. The method of claim 8, wherein the first operating mode corresponds to an IEEE 802.1D mode and the second mode corresponds to an IEEE 802.1Q mode.

5

5

10

forwarding the data frame to the first transmit port.

13. The method of claim 8, further comprising:

identifying data forwarding information for a first one of the received data frames; and

generating a forwarding descriptor for the first data frame, the forwarding descriptor

including:

an untagged set field identifying at least one transmit port, and

an opcode field including information identifying whether the first data frame

was at least one of untagged, VLAN-tagged and priority-tagged.

14. The method of claim 13, further comprising:

deleting a VLAN tag in the first data frame based on the contents of the untagged set

field and the opcode field and whether the network device is operating in the second

operating mode.

15. A network device comprising:

a plurality of receive ports configured to receive data frames from a plurality of stations;

a plurality of transmit ports configured to transmit data frames;

a memory configured to store address information and data forwarding information

associated with the received data frames;

a decision making engine configured to:

identify data forwarding information for a first one of the received data

frames, the data forwarding information identifying at least a first one of the transmit ports and a

first virtual local area network (VLAN);

generate a forwarding descriptor for the first data frame, the forwarding

descriptor including:

an untagged set field identifying at least one transmit port, and

a first opcode field including information identifying whether the first

data frame was at least one of untagged, VLAN-tagged and priority-tagged; and

15 processing logic configured to:

generate a second opcode to indicate that the first data frame is to be transmitted without modification, when the network device is operating in accordance with a first protocol, and

20 generate a second opcode to indicate that the first data frame is to be transmitted without a VLAN tag, the first data frame is to be transmitted with a VLAN tag or the first data frame is to be transmitted without modification, when the network device is operating in accordance with a second protocol and based on the contents of the untagged set field and the first opcode field.

16. The network device of claim 15, wherein the first protocol corresponds to an IEEE 802.1D protocol and the second protocol corresponds to an IEEE 802.1Q protocol.

17. The network device of claim 15, further comprising:
a plurality of transmit modules corresponding to the transmit ports, at least a first one of the transmit modules being configured to:

5 retrieve the first data frame from an external memory, and
forward the first data frame to at least the first transmit port without at least one of inserting VLAN information into the first data frame, deleting VLAN information included with the first data frame and modifying VLAN information included with the first data frame, when the network device is operating in accordance with the first protocol.

18. The network device of claim 17, wherein the first transmit module is further configured to:

at least one of insert VLAN information into the first data frame, delete VLAN information included with the first data frame and modify VLAN information included with the first data frame, when the network device is operating in accordance with the second protocol and based on the second opcode, and

forward the first data frame to at least the first transmit port.

19. The network device of claim 15, wherein the decision making device is further configured to assign a default VLAN index to received data frames when the network device is operating in accordance with the first protocol.

20. The network device of claim 19, wherein the decision making device is further configured to at least one of assign a VLAN index to a received data frame based on the port on which the data frame was received and assign a VLAN index to a received data frame based on a VLAN identifier included in the received data frame, when the network device is operating in accordance with the second protocol.